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FAMOUS MINERAL LOCALITIES: MT. MICA, MT. APATITE AND OTHER LOCALITIES IN MAINE

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New York City

No doubt it is the desire of most collectors of minerals to visit the famous mineral localities in Maine. This desire on the part of the writers has been gratified and a few brief extracts from notes made on their trip may be of interest to readers of this magazine.

The trip was made during the month of June, 1916, and was one of great interest and pleasure. With the aid of an automobile much ground was covered. We were unable, however, to give to each locality visited time and attention necessary to make other than superficial observations. For a technical description of the localities mentioned in this brief article readers are referred to U. S. Geological Survey *Bulletin* 445, "Geology of the Pegmatites and Associated Rocks of Maine," by E. S. Bastin, which we found to be very useful as a reference and guidebook.

After an all-night journey by train from New York City we arrived in Portland in the early morning. The train for Norway, our first objective, did not leave until afternoon and a few hours were spent in sightseeing in Portland, including a visit to the Maine State Fair, which opened that day. Maine being well known as a source of gem tourmalines, we felt sure that minerals would be on display, and it was a disappointment to find instead everything from canned corn to cream cheese. Train time arrived and after a journey of about 49 miles on the Grand Trunk Railroad we arrived late in the afternoon at the little town of Norway, our first stop. We were in this town for three days and found good accommodations at the local hotel. One of the residents, Mr. George Howe, is the president of the Maine Academy of Science, and is an enthusiast on all matters pertaining

to the natural sciences. Owing to his wide knowledge of Maine minerals his advice as to localities to be visited was of great help. Another resident, Mr. Charles B. Hamilton, a mineralogist and entomologist by avocation, was our companion for several days and in many ways made our stay in Norway one of extreme satisfaction.

The first visit was made to the Noyes mine located on the western slope of Noyes hill in the town of Greenwood, about five miles from Norway. (Fig. 1, Plate 16.) The pit is near the summit of the hill, whose elevation is 1400 feet. To reach the mine it was necessary to climb the steep wooded hillside and over waste material which had been thrown out, and as mica was quite abundant the ascent was somewhat laborious to one used to city sidewalks. The rock in place was a coarse pegmatite, but no pockets were observed. In the pit a few specimens of yellowish green spodumene were dug out. There was plenty of material on the dump to explore and in a few hours' work there were found specimens of white and purple lepidolite, clusters of quartz crystals associated with the "hydromica" cookeite, fine pale lavender colored apatite crystals of a thin tabular form, and a few sections of beryl crystals. Other minerals are known to occur here, notably cassiterite, herderite and phenacite, but were not noted by us. A systematic and thoro search of this waste pile no doubt would bring forth many specimens.

After lunch we journeyed on to the chrysoberyl locality in the Witt hill region in the northeast corner of the town of Norway. Here a pegmatite ledge had been opened some years before by George Howe and specimens of chrysoberyl, gahnite and zircon were uncovered. There was no trouble in obtaining a good supply of small crystals of chrysoberyl of a thin flattened form showing the repeated twin habit. A few coarse garnets and minute crystals of zircon in square prisms were also obtained.

The next morning an early start was made for the famous Mt. Mica mine, located about 1½ miles east of the village of Paris. (Fig. 1, Plate 15.) It was only a short run from Norway thru the towns of South Paris and Paris, and we were soon on the spot known to all mineralogists. Mt. Mica has an approximate elevation of 900 feet and from its summit affords a fine view of the immediate vicinity. Along the roadway leading up to the mine many large blocks of purple lepidolite were noted, in fact this mineral was extremely plentiful both here and at Mt.

Apatite. No work was in progress and the deeper parts of the pit were filled with water. Mr. Loren B. Merrill, the owner, had worked the mine for about four months during the previous year and discontinued when the water froze over. There were several pockets in evidence and these were filled with water but in the decomposed clevelandite at the bottom a few slender crystals of transparent green tourmaline were found. Most of the quarry waste has been dumped into abandoned workings, and by exploring this material we found enough specimens to fill our bags. Among the minerals were biotite, clevelandite (the variety of albite) cookeite, muscovite enclosing slender crystals of green tourmaline, lepidolite of varying degrees of, texture and of purple hues, massive pink and green beryl, pink montmorillonite, pink and green tourmalines in the solid pegmatite, making attractive cabinet specimens, and garnets upon which were noted minute crystals of autunite. Black tourmaline crystals were plentiful, but as usual were hard to remove without fracture. Microscopic crystals of green tourmaline were also found. This mine relies wholly upon the production of tourmalines to keep it in operation and in this respect it is unlike the quarries at Mt. Apatite where the mining of tourmalines is incidental to the production of feldspar. The gem-bearing zone lies below a schist capping and dips at such an angle that as the work progresses more overhead rock has to be removed. The result is that mining at Mt. Mica is growing more expensive and unless methods other than open mining with its hand drilling and a one-horse windlass are adopted it cannot help becoming extinct.

At the foot of Mt. Mica, on land of James E. Bowker, there is an outcrop of pale rose-colored quartz and no doubt a few blasts to remove the surface material would produce specimens of a deeper color. Some of the quartz is semi-transparent and of the asteriated variety, polished spheres of which when held before a single flame show by the transmitted light a six, twelve- or eighteen-rayed star, this latter feature depending upon the transparency of the stone, which in turn is influenced by the number of needle-like inclusions that cause this phenomenon.

After lunch a call was made on Mr. Merrill, the owner of the Mt. Mica mine, who during our short stay made our visit of much interest. In addition to Mt. Mica specimens, Mr. Merrill has a fine collection of other minerals which are attractively displayed. We were shown large sections of gem green tourma-

line crystals, including a smooth nodule weighing 411 carats, which is probably the largest flawless piece of transparent green tourmaline known and its value in dollars runs into the hundreds. On Mr. Merrill's property is a most interesting stone wall. One hears of stone wall geology but here is stone wall mineralogy. The wall is built of large crystals of quartz of varying shades from white to smoky, blocks of purple lepidolite, rose quartz, amblygonite, clevelandite, mica and other minerals from the Mt. Mica mine, the whole making a very attractive and unique display of minerals.

The rest of the day was spent at the Ordway farm, located in the town of Norway. (Fig. 3, Plate 16.) Mr. Hamilton, our host and guide, discovered this locality some years before, and put in a few blasts by permission of the owner. Here was observed an outcrop of fine grained granite thru which ran a single pegmatite vein. This vein was made up mostly of an opaque smoky quartz and attached to the walls of the granite adjoining either side of the vein were beautiful white orthoclase crystals. It was difficult to extract the hard matrix, to which were attached the fragile crystals. However, a number of orthoclase crystals were obtained, one specimen in particular being a perfect crystal about two inches long and one inch thick jutting out from the matrix. Broken fragments of columbite crystals were also found. Further blasting on this property was stopped by the owner, which is unfortunate, as there is every evidence that more orthoclase crystals could be obtained. It is a fact indeed that almost everyone who owns a piece of land in Oxford County upon which there is an outcrop of rock believes he has a gem mine.

Finding our specimens accumulating fast, the next morning was spent in boxing and shipping them home. In the afternoon we left Norway for Auburn, traveling by automobile with the mail carrier. Except for one or two detours the road kept quite close to the Little Androscoggin river.

The following day we were joined by Prof. Freeman F. Burr, a fellow member of the New York Mineralogical Club. Prof. Burr's home is in Maine and since our visit he has been appointed State Geologist of that State. Mt. Apatite, our next objective, lies about six miles west of Auburn and is easily reached by trolley. As some collectors and other visitors to Mt. Apatite had in the past abused the privilege and committed depredations on the property, visitors were not allowed in the quarries and watchmen

were on guard. We called on P. P. Pulsifer, the owner of one of the mines at Mt. Apatite, who lives a short distance from the mine. We found in him a kindly and courteous gentleman. While at Mr. Pulsifer's house we were shown what is probably the finest purple apatite crystal yet found at Mt. Apatite. It is of a beautiful amethyst color, cloudy in portions but in small areas perfectly clear and of gem quality; the crystal measures 3.8 cm. by 4.3 cm. in the horizontal direction and 3 cm. in the vertical direction and weighs slightly over 100 g.[1] At the time of our visit it was valued at $500 and it is a pleasure to note here that this specimen has since been installed in the famous collection of Col. Washington A. Roebling, of Trenton, N. J.

Mr. Pulsifer accompanied us to Mt. Apatite and as our time was limited we only visited two of the workings, the Pulsifer and the Towne mines; this latter mine has since been taken over by Mr. Pulsifer. Practically the whole of Mt. Apatite is made up of pegmatite with an occasional trap dike. These dikes, so Mr. Pulsifer informed us, are regarded as a good sign as they seem to denote the presence of gem material. (Fig. 2, Plate 16.) The Pulsifer mine was opened in 1901 and has been worked more or less since that time. (Fig. 2, Plate 15.) Many beautiful crystals of pink and green tourmaline have been taken out and it was here that the famous purple apatites were found. No pockets were exposed, and the mine was not in operation at the time of our visit. There was, however, a good sized dump of waste material, and in turning this over there were found specimens of lepidolite, amblygonite, clevelandite, almost transparent and bluish-green tourmalines associated with mica, a few small purple apatites in a white quartz matrix, and quartz crystals of various sizes from one to four inches in diameter, mostly of the smoky variety.

The Towne feldspar and gem mine is about 100 yards from the Pulsifer mine, and was opened in 1907. Here also was a large dump and while it did not look as fresh as the material at the Pulsifer mine and had the appearance of being well picked over, many specimens were found. Among them fine purple lepidolite which occurred in granular aggregates of small scales and in large curved crystals with rounded botryoidal surfaces one-half inch or more in diameter, amblygonite, clevelandite of

[1] This crystal has been described by Professor Ford: *Am. J. Sci.*, [4], **44**, 245–246, 1917; abstract in *Am. Min.*, **3**, (6), 138, 1918. See also minutes of N. Y. M. C. meeting, page 175, below.

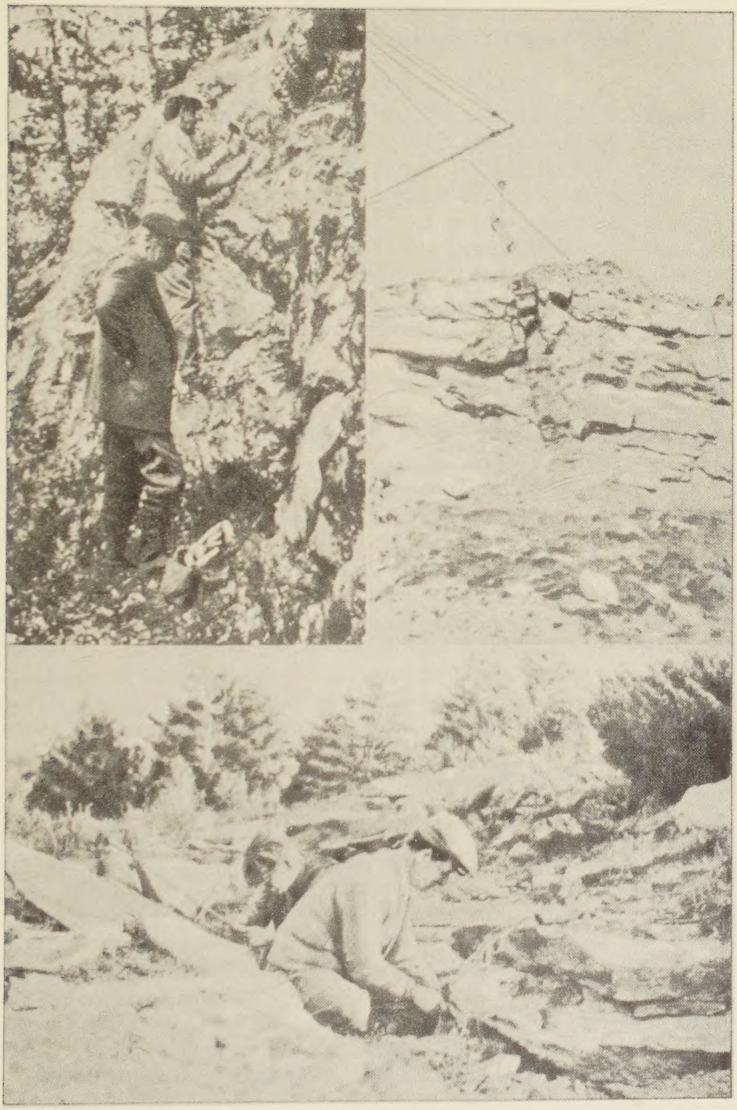
the white lamellar variety, green tourmaline in mica, and small crystals of herderite coating quartz crystals. One could not help noticing the large number of smoky quartz crystals of various sizes, but nearly all being coated with discolored albite, they were unattractive as cabinet specimens.

After lunch the next stop was at the Berry feldspar quarry in the town of Poland just across the Little Androscoggin river opposite Mt. Apatite. This quarry was opened in 1900 and has been worked for feldspar. The general character of the rock is similar to that at Mt. Apatite. At the time of our visit two pockets were exposed, both a foot or more across and several feet deep, from which there had been removed several barrels of kaolin without uncovering a single tourmaline crystal. (Fig. 2, Plate 16.) We worked in one of the pockets and after digging out some more kaolin in the further end of the pocket broke down the thin wall of an adjoining chamber. The chamber was filled with decomposed clevelandite, which usually denoted the presence of gem tourmalines, but after removing all the material in the pocket as far as the arm could reach we were rewarded with a few doubly terminated pinched quartz crystals, white in color. These were all the specimens found here and we were fortunate indeed to obtain these as the quarry had not been in operation for six months and every pleasant Sunday it is "black with collectors," so we were informed.

Adjoining Mr. Berry's mine is the Havey prospect where some fine gem tourmalines have been taken out. There was no collecting here as there was no dump in evidence and there was no loose material on the floor of the quarry. This ended our search for minerals and we returned to Auburn late in the afternoon. We left Auburn the next morning and ten hours later stepped off the train in New York City.

To those who may be planning a visit to Maine mineral localities it would be well to make the trip later in the year, say in September or October, when there would be an accumulation of fresh waste material on the dumps at the active mines. There should be very little trouble in gaining access to the various properties, especially if the visitor has come from a distance, for we found the owners very willing and obliging.

PLATE 16.



Photos J. G. Manchester.

MAINE MINERAL LOCALITIES.

1. Noyes Mine, Greenwood.

2. Trap Dike, Berry Mine, Poland.

3. Orthoclase Deposit, Ordway Farm, Norway.

PROCEEDINGS OF SOCIETIES

THE NEW YORK MINERALOGICAL CLUB

Excursion and Special Meeting

An afternoon meeting of the New York Mineralogical Club which had been contemplated for May, but deferred in order that a Saturday half holiday might be available for it, was held on June 8, 1918, in the Hall of Geology at Rutgers College, New Brunswick N. J., from about 2.30 to 6 p.m.

The members and guests on arrival from various points were received by the Curator, Dr. W. S. Valiant, Dr. J. Volney Lewis, Mr. John A. Manley and Mr. Frederick H. Baumann, and then dispersed thru the Hall to examine the Chester[1] and Beck[2] Collections (the principal object of the excursion) and four special exhibits which had been provided for the occasion and were displayed on tables for close inspection.

The first of the special exhibits was by Messrs. Valiant and Lewis and consisted of the following items: (1) A series of specimens of mica (chiefly phlogopite) from several old mica mines; (2) scapolite, serpentine, and ophicalcite from Ringwood; (3) ilmenite crystals, Princeton; (4) vivianite in crystals, laminated ferrous phosphate and limonite crusts, all in glauconite rock from Telegraph Hill; New Jersey; and (5) fibrous tremolite and serpentine minerals from Easton, Pa.

The second and third were by Mr. John A. Manley, and were two supplementary series of zeolites, prehnite, and copper minerals, from the Chimney Rock Quarry near Bound Brook, N. J., one of cabinet the other of microscopic specimens. An attractive feature of them was the occurrence of native copper in slender needles bounded and terminated by crystal planes penetrating thru and protruding from the hemispheres of mammillary prehnite, the facets beautifully discernible under the stereo-binocular microscope provided to show them.

The fourth exhibit was by Col. Washington A. Roebling and in charge of Mr. Frederick H. Baumann. It consisted of 41 specimens all very rare or otherwise of interest, 28 from Franklin Furnace, N. J., the remainder from both foreign and domestic localities. Of these a purple apatite crystal of superb color, from Auburn, Me.;[3] leucophoenicite in small transparent crystals, labeled "best in the world"; two specimens of gageite crystals; hodgkinsonite, manganosite xld, friedelite and nasonite, among the Franklin minerals; retinite from Roebling, N. J., and phenacite from Brazil attracted much attention.

By the late afternoon 25 persons had registered as attending, notable visitors among them being Mrs. Georgiana W. Chester, Mr. A. H. Chester, Jr.; Dr. M. W. Twitchell, Associate State Geologist, and R. B. Gage, Chemist to the Geol. Survey. of N. J.

[1] For a description of the Chester collection see *Mineral Collector*, **10**, 49–53, 1903.

[2] For a description of the Beck collection see *Mineral Collector*, **7**, 20–24, and 37–40, 1900.

[3] Described by Mr. Manchester elsewhere.

About 5.30 p.m. the meeting was called to order and the appreciation of the Club expressed in resolutions of thanks to Messrs. Lewis and Valiant, Col. Roebling and Mr. Manley for their contributions to the occasion. After some discussion of the eclipse of the Sun then nearly due, the meeting adjourned.

Fifteen of those present assembled at 6 p.m. at Klein's Hotel, New Brunswick, for dinner during which, between courses, the progressing eclipse was a subject of much attention.

Wallace Goold Levison, *Secretary*

THE PHILADELPHIA MINERALOGICAL SOCIETY

Wagner Free Institute of Science, June 13, 1819

A stated meeting of the society was held on the above date with the president, Dr. Leffmann, in the chair. Sixteen members and one visitor were present.

Mr. Charles Hoadley addressed the society on a trip taken to Haddam, Middletown, Bristol, Trumbull, and other localities in Connecticut. Mr. Trudell reported a trip to Lenni, where chabazite, natrolite, stilbite, and actinolite were obtained. Mr. Hoadley reported a trip to Phœnixville. Altho the mines have been long abandoned, and the dumps hauled away and plowed over, the following minerals were obtained by the party: anglesite, cerussite, pyromorphite, wulfenite, calcite, fluorite, sphalerite, and calamine. The meeting concluded with an exhibition of pegmatite minerals.

Samuel G. Gordon, *Secretary*

LITERARY AND PHILOSOPHICAL SOCIETY

Manchester, England, April 23, 1918

Mr. W. Thomson, president, in the chair. Dr. E. Newbery and H. Lupton: Radio-activity and the coloration of minerals.

A number of mineral specimens were examined as to their behavior (*a*) on heating, (*b*) on treatment with radium or cathode rays before or after heating, and (*c*) on heating after treatment (*b*). Several brilliant color effects were obtained, among which may be mentioned the complete restoration of the original color to green fluorite, smoky quartz, zircon, topaz, etc., which had been decolorized by heat, the production of a fine deep blue color in a colorless fluorite from Matlock by radium, an intense purple in a colorless fluorite from the Pyrenees by cathode rays, and an indigo blue in transparent barites by radium. A bright green thermo-luminescence was imparted to all the fluorites used, and their original violet thermo-luminescence was also restored if that had been destroyed by previous heating. A Spanish phosphorite gave a brilliant yellow thermo-luminescence which was restored with increased strength by radium or cathode rays. It was concluded that many minerals owe their color and thermo-luminescence to the presence of radio-active matter either in the water from which they have been deposited or in the surrounding rock. Traces of certain inorganic impurities are acted upon by α, β or γ rays

and dissociated, the size and density of the resulting particles determining the color produced. On heating, the dissociated atoms recombine with evolution of light and loss of color to the minerals. *Nature,* **101,** (2532), 198, 1918.

NOTES AND NEWS

We learn that the Bruce Museum, of Greenwich, Connecticut, has an attractive room, fitted with fine new cases, for the display of a mineral collection, but as yet practically no minerals are available. Here is an excellent opportunity for some one to place a moderate sized collection where it will find a permanent home and do a maximum amount of good. If any of our readers feel able to help out, we suggest that they correspond with Dr. Edward F. Bigelow, Sound Beach, Connecticut.

It is with the deepest regret that we chronicle the death early in August of George O. Simmons, of Brooklyn, N. Y. For forty years or more a collector of minerals, Mr. Simmons was, from the inception of this magazine, one of its staunchest supporters. We hope soon to be able to publish a sketch of his life and work.

The chromite mines in the southern part of Lancaster County, Pennsylvania, formerly famous as localities for brucite, kämmererite, serpentine variety williamsite, and many other minerals, which have been idle for many years, are being reopened.

NEW MINERALS

COLLBRANITE

D. F. Higgins; Geology and ore deposits of the Collbran contact of the Suan Mining Concession, Korea. *Econ. Geol.,* **13,** (1), 19, 1918. Previously referred to as ilvaite by S. Koto, *J. Coll. Sci. Imp. Univ. Tokyo,* May, 1910.

NAME: after Mr. H. Collbran and his son, A. H. Collbran, developers of the mine.

Color: black. Form: stellate aggregates of acicular crystals; also massive. Composition: a highly ferriferous pyroxene of the hedenbergite type. Occurs as a contact metamorphic mineral in marble at the Suan Mining Concession, Central Korea. S. G. G.

ABSTRACTS OF MINERALOGIC LITERATURE

AN APPLICATION OF POLYDIMENSIONAL GEOMETRY TO CHEMICO-MINERALOGICAL PROBLEMS; THE COMPOSITION OF TOURMALINE. H. E. BOEKE. *Neues Jahrb. Min. Geol.,* **1916,** II, 109–143; thru *J. Chem. Soc.,* **112,** II, 178–179, 1917.

By plotting the analyses of tourmaline along 4 or 5 dimensions in space the author endeavors to arrive at the true formula of tourmaline. Most of the analyses agree with the general formula of Penfield, $R_{20}Si_4B_2O_{21}$. E. T. W.

NOTES ON NEWLY RECORDED RHODESIAN MINERALS. A. E. V. Zealley. *Proc. Rhodesia Sci. Assoc.*, **16**, 17, 1917; abstracted by G. A. J. C., *Nature*, **101**, (2531), 174, 1918.

Includes an account of the stanniferous tantalite of the Victoria tinfield, discovered in 1911, but not hitherto described. Two other Rhodesian occurrences of tantalite are noticed. S. G. G.

AN ADDITIONAL NOTE ON THE "OOLITIC AND PISOLITIC BARITE FROM THE SARATOGA OIL FIELD, TEXAS." E. S. Moore. Pennsylvania State College. *Science*, **46**, (1188), 342, 1917.

Information furnished by wells seems to indicate that the barite occurs in a definite geological horizon. It is believed that some of the material formed in the wells after they were equipped. In most cases no definite nucleus could be found. "It would seem to demonstrate that living organisms were not essential to the development of oolites and that these may form where precipitation is taking place in an agitated solution, in the absence of life."

S. G. G.

APATITE FROM THE LAKE LAACH DISTRICT; SULFATE-APATITE AND CARBONATE-APATITE. R. Brauns. *Neues Jahrb. Min. Geol., Beil.-Bd.*, **41**, 60–92, 1916; thru *J. Chem. Soc.*, **110**, II, 532–533, 1916.

Minute crystals in the rocks of this region have been studied crystallographically, optically and chemically. One type contains over 1 per cent. SO_3, another considerable CO_2. An excess of CaO is also usually present. The general formula of apatite is therefore $3Ca_3P_2O_8.Ca\ (F_2,Cl_2,SO_4,\ CO_3,\ O,\ (OH)_2)$. CO_2 has also been found in noselite. E. T. W.

OBSERVATIONS ON CERTAIN TYPES OF CHALCOCITE AND THEIR CHARACTERISTIC ETCH PATTERNS. C. F. Tolman, Jr. Stanford University. *Trans. Am. Inst. Min. Eng.*, **54**, 402–435, 1917. With a discussion by Louis C. Graton, Alfred C. Lane, J. T. Singewald, Jr., Charles P. Berkey, E. Posnjak, E. T. Allen, and H. E. Merwin; *ibid.*, p. 436–442.—(Revision of article abstracted in *Am. Min.*, **1**, (1), 15, 1916).

A metallographic study was made of chalcocite from the Kennecott-Bonanza mines, Alaska; Apache Mines, Santa Cataline Mts., Arizona; Bingham, Utah; and Miami, Ariz.

The Bingham chalcocite was found to be meta-colloidal, a variety not heretofore described. The material is porous and shows a marked mammillary structure, typical of meta-colloids.

From this study the writer makes the following general conclusions in regard to etch figures. No isometric etch figures have been found in natural chalcocite, that are not inherited from some antecedent mineral, generally bornite. Regular inherited isometric structures are found in chalcocite formed presumably by ascending solutions, and certainly by descending solutions. Orthorhombic etch structure with one-direction cleavage, or parting distinctly more regular than other directions, is found wherever the structure of the mineral replaced does not govern. The development of a very fine orthorhombic etch structure consisting of minute individuals each lined with parallel striations is suggestive of meta-colloidal chalcocite, all gradations existing between this type of etching and the coarser, more irregular structure. S. G. G.

PLATE 17.

TABLE SHOWING THE SYMMETRY OF CRYSTALS

PREPARED BY J.E. POGUE – 1915.

SYSTEM	CLASS (32 in all, 18 important)	CENTER OF SYMMETRY	PLANES OF SYMMETRY: Axial, Vertical	Axial, Horiz'tal	Diagonal	AXES OF SYMMETRY (⬢ Hexagonal, ■ Tetragonal, ▲ Trigonal, ⬬ Binary)	SYMMETRY OF CRYSTALLOGRAPHIC AXES: a-Axis	b-Axis	c-Axis
Isometric	Normal	1	2	1	6	3 ■ 4 ▲ 6 ⬬	■	■	■
	Pyritohedral	1	2	1		3 ⬬ 4 ▲	⬬	⬬	⬬
	Tetrahedral	0			6	3 ⬬ 4 ▲	⬬	⬬	⬬
Tetragonal	Normal	1	2	1	2	1 ■ 4 ⬬	⬬	⬬	■
	Sphenoidal	0			2	3 ⬬	⬬	⬬	⬬
	Tri-Pyramidal	1		1		1 ■			■
Hexagonal	Normal	1	3	1	3	1 ⬢ 6 ⬬	⬬		⬢
	Tri-Pyramidal	1		1		1 ⬢			⬢
	Hemimorphic	0	3		3	1 ⬢			⬢
Trigonal	Normal	1			3	1 ▲ 3 ⬬	⬬		▲
	Hemimorphic	0			3	1 ▲			▲
	Tri-Rhombohedral	1				1 ▲			▲
	Trapezohedral	0				1 ▲ 3 ⬬	⬬		
Orthorhombic	Normal	1	2	1		3 ⬬	⬬	⬬	⬬
	Hemimorphic	0	2			1 ⬬			⬬
	Sphenoidal	0				3 ⬬	⬬	⬬	⬬
Monoclinic	Normal	1	1			1 ⬬		⬬	
Triclinic	Normal	1							

TABLE OF SYMMETRY FOR THE MORE IMPORTANT CRYSTAL CLASSES.